

(19) 世界知的所有権機関
国際事務局



(43) 国際公開日
2004 年 4 月 8 日 (08.04.2004)

PCT

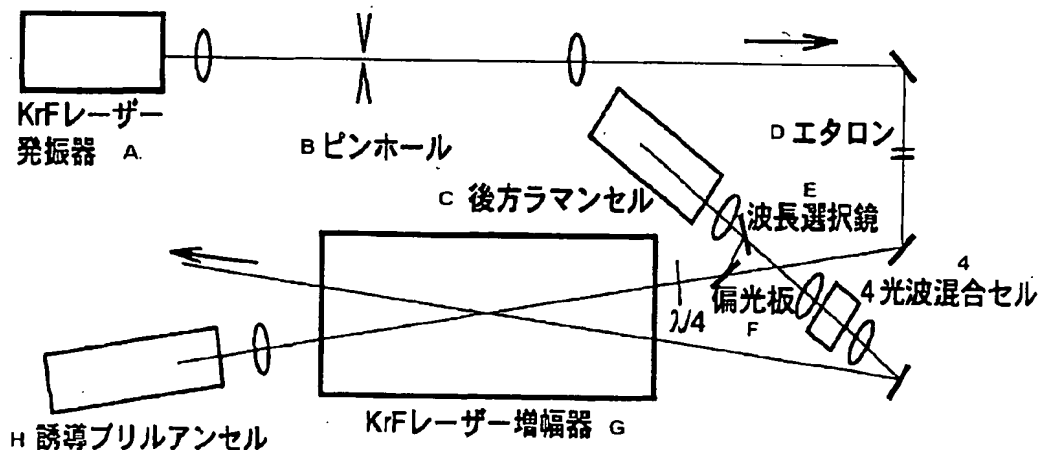
(10) 国際公開番号
WO 2004/029713 A1

- (51) 国際特許分類⁷: G02F 1/35 (72) 発明者; および
(75) 発明者/出願人 (米国についてののみ): 高橋 栄一 (TAKA-HASHI, Eiichi) [JP/JP]; 〒305-8568 茨城県 つくば市 梅園 1-1-1 中央第 2 独立行政法人産業技術総合研究所内 Ibaraki (JP). ロゼフ レオニード (LO-SEV, Leonid) [RU/RU]; 〒305-8658 茨城県 つくば市 梅園 1-1-1 中央第 2 独立行政法人産業技術総合研究所内 Ibaraki (JP). 松本 裕治 (MATSUMOTO, Yuuji) [JP/JP]; 〒305-8568 茨城県 つくば市 梅園 1-1-1 中央第 2 独立行政法人産業技術総合研究所内 Ibaraki (JP). 大和田野 芳郎 (OWADANO, Yoshiro) [JP/JP]; 〒305-8568 茨城県 つくば市 梅園 1-1-1 中央第 2 独立行政法人産業技術総合研究所内 Ibaraki (JP).
- (21) 国際出願番号: PCT/JP2003/012524
- (22) 国際出願日: 2003 年 9 月 30 日 (30.09.2003)
- (25) 国際出願の言語: 日本語
- (26) 国際公開の言語: 日本語
- (30) 優先権データ:
特願2002-286116 2002 年 9 月 30 日 (30.09.2002) JP
- (71) 出願人 (米国を除く全ての指定国について): 独立行政法人産業技術総合研究所 (NATIONAL INSTITUTE OF ADVANCED INDUSTRIAL SCIENCE AND TECHNOLOGY) [JP/JP]; 〒100-8921 東京都千代田区 霞ヶ関 1 丁目 3 番 1 号 Tokyo (JP).
- (81) 指定国 (国内): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NI,

[続葉有]

(54) Title: METHOD AND SYSTEM FOR GENERATING ULTRASHORT LASER PULSE

(54) 発明の名称: 超短レーザーパルス発生方法及び装置



A... KrF LASER OSCILLATOR
B... PINHOLE
C... REAR RAMAN CELL
D... ETALON

E... WAVELENGTH SELECTING MIRROR
F... POLARIZING PLATE
G... KrF LASER AMPLIFIER
H... INDUCTION BRILLOUIN CELL
4... LIGHT WAVE MIXING CELL

(57) Abstract: Contrast is enhanced significantly in front of a laser pulse by converting the wavelength of the laser pulse temporarily into another one using nonlinear optical action, increasing the intensity ratio between a pulse peak and its preceding part and then reconverting the wavelength of the converted laser beam into the original wavelength using nonlinear optical action. At the same time, the laser pulse can be saturation-amplified by a laser amplifier to form an ultrashort pulse. An ultrashort excimer laser pulse is thereby generated without using an expensive mode lock laser.

[続葉有]

WO 2004/029713 A1



NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.

OAPI 特許 (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

(84) 指定国 (広域): ARIPO 特許 (GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW), ユーラシア特許 (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), ヨーロッパ特許 (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, RO, SE, SI, SK, TR),

添付公開書類:

— 国際調査報告書

2 文字コード及び他の略語については、定期発行される各 PCT ガゼットの巻頭に掲載されている「コードと略語のガイダンスノート」を参照。

(57) 要約: 本願発明は、レーザーパルス为非線形光学作用を用いて一旦他の波長に変換し時間的なパルスピークとその前部に対する強度比を大きくし、その変換されたレーザー光を再び元の波長に非線形光学作用を用いて再変換することによって、該パルス的前方部分のコントラストを著しく高めると同時に用いたレーザー増幅器により増幅することを可能にし、そのパルスを飽和増幅することによって超短パルスを形成する。超短エキシマレーザーパルスの生成において、高価なモードロックレーザーを用いずに、超短エキシマレーザーパルスの生成を行う。

INTERNATIONAL SEARCH REPORT

International application No.

PCT/JP03/12524

A. CLASSIFICATION OF SUBJECT MATTER

Int.Cl⁷ G02F1/35

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

Int.Cl⁷ G02F1/35, H01S3/00

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Jitsuyo Shinan Koho	1922-1996	Toroku Jitsuyo Shinan Koho	1994-2003
Kokai Jitsuyo Shinan Koho	1971-2003	Jitsuyo Shinan Toroku Koho	1996-2003

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)
JICST, INSPEC, esp@cenet

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	Grasyuk, A.Z. et al., Compression of light pulses by stimulated Raman scattering without afrequency shift, Sov.J.Quantum Electron., Vol.19, No.8, August, 1989, pages 1045 to 1046	1-8
Y	JP 2002-62553 A (National Institute of Advanced Industrial Science and Technology), 28 February, 2002 (28.02.02), (Family: none)	1-8

☐ Further documents are listed in the continuation of Box C.

☐ See patent family annex.

* Special categories of cited documents:

"A" document defining the general state of the art which is not considered to be of particular relevance
 "E" earlier document but published on or after the international filing date
 "L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
 "O" document referring to an oral disclosure, use, exhibition or other means
 "P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
 "X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
 "Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
 "&" document member of the same patent family

Date of the actual completion of the international search
10 December, 2003 (10.12.03)

Date of mailing of the international search report
13 January, 2004 (13.01.04)

Name and mailing address of the ISA/
Japanese Patent Office

Authorized officer

Facsimile No.

Telephone No.